LANDS AND FORESTS
TECHNICAL NOTE

WINTER TRACKING OF COYOTES

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Introduction

The coyote population in Nova Scotia is increasing and it becomes important for Nova Scotia game managers to better understand this animal. A special public concern is the coyote's relationship to deer and to other wildlife.

One of the more direct methods to observe coyote behaviour is to follow coyote tracks on the snow. This note describes a coyote tracking study undertaken during the winters of 1983, 1984 and 1985.

Materials and Methods

Fresh coyote tracks on the snow were located, followed, and observations recorded. A metric hip chain was used to measure the distances over which coyotes were followed or back-tracked, and to measure the distance through various forest stands. Tracking was best done shortly after snowstorms where there was sufficient new snow to cover the ground under thickets and before an accumulation of tracks made tracking difficult.

Coyote scats were collected during the 1983 season and the contents identified. All scats were fresh and associated with coyote tracks on the snow.

Most observations were at the Chignecto Game Sanctuary. In 1985, four trails followed were in Cumberland and Colchester counties but not on the Sanctuary.

Results and Discussion

During the 1983, 1984 and 1985 winters coyote trails were followed on 23 days for a total distance of 79 kilometres. The number of coyotes in a group averaged 2.4 (range one to four), so the total number of individual coyote trails followed was 190 kilometres.

Prey Species and Hunting Methods

Observations were made of two deer killed by coyotes; two deer unsuccessfully pursued by coyotes; coyotes feeding on previously dead carcasses of six deer and two moose; 11 snowshoe hare, two ruffed grouse and one goshawk killed and eaten by coyotes. Two of the previously dead deer carcasses had been killed by coyotes and three by either coyote or bobcat (Table 1).

Table 1. *Animals killed or pursued by coyotes or fed upon as carrion.*

Moose and Deer						
Date	Age	Femur % Fat	Known or Suspected Cause of Death	Snowshoe Hare Kills	Ruffed Grouse Kills	Other Kills
* 2 Feb./83 Deer	3.5	85.0	Hunter Loss	14 Feb./83	10 Feb./84	Goshawk
23 Feb./83 Deer	0.5	---	Coyote	3 Feb./84	30 Jan./85	26 Feb./85
* 7 Mar./83 Deer	0.5	---	Coyote or Bobcat	3 Feb./84		
12 Mar./84 Deer	---	---	Unsuccessful Chase	9 Feb./84		
*12 Feb./85 Deer	2.5	---	Coyote or Bobcat	9 Feb./84		
*26 Feb./85 Deer	0.5	85.0	Coyote	10 Feb./84		
*26 Feb./85 Deer	2.5	85.0	Coyote or Bobcat	10 Feb./84		
1 Mar./85 Deer	0.5	1.5	Coyote	12 Feb./84		
*11 Mar./85 Deer	0.5	1.5	Coyote	31 Jan./85		
19 Mar./85 Deer	---	---	Unsuccessful Chase	6 Feb./85		
*30 Jan./85 Moose	Adult	---	Disease	6 Feb./85		
*12 Feb./85 Moose	0.5	---	Disease or Predator			

* *Previously dead (carrion)*

In many instances groups of two to four coyotes travelled in single file. Their direction of travel often seemed definite. On other instances, coyotes travelled separated by distances of 25 to 50 metres, and one sensed that they were hunting. This behaviour was often associated with good snowshoe hare habitat.

Track evidence indicates that coyotes caught sitting hares. The hare's stomach, pieces of hair, and sometimes the hind feet was all that was left. When there were groups of coyotes, there were often beds used for short periods near the kill site – possibly by coyotes not sharing in the kill. Scats and urine were often associated with kill/feeding sites.

Coyotes caught and ate a goshawk. Tracks of two coyotes travelling in single file were observed to slow to a stalking pace on approaching a small clearing. In line with the tracks about ten metres distance was a 1.5 metre high spruce. On the opposite side were the tail and leg remains of the goshawk. Red squirrel tracks were evident on the snow so it is assumed that the hawk was feeding on, or watching for squirrels.

Two unsuccessful and two successful attempts to kill deer were observed. On March 12, 1984, a tuft of loose deer hair and broken branches at the base of a spruce tree were observed where two coyotes encountered a deer. The deer bounded off in long leaps and the coyote(s) followed for 55 metres before slowing to a walk and apparently gave up the chase. There was no deer bed so it is thought that the deer was standing when attacked.

On March 19, 1985, two coyotes were tracked 2576 metres to a point where a group of deer were bedded on the edge of a clearcut. Several running tracks were observed and the coyotes gave pursuit for 424 metres before again walking. Prior to encountering the deer, the coyotes were travelling single file in the woods and parallel to a road. Snow was hard and settled so deer movement was not restricted. However, a deer running across the clearcut did have some difficulty when breaking through the crust.

On February 23, 1983, tracks of three coyotes were followed. The track of one coyote (separated by 50 metres from the other coyotes) encountered several deer beds. Tracks of running deer were observed, with some deer tracks slowing to a walk and circling. One male fawn, about 25 kilograms in weight, was chased and killed. Flesh under the skin in the larnyx area was hemorrhaged. The coyotes consumed only a small amount of the carcass, at the back of the thigh. Before leaving, the carcass was partially covered with snow, presumably by pushing snow against it with their muzzles. The three coyotes bedded down about 25 metres away before leaving the area.

On March 1, 1985, two coyotes were back-tracked 3782 metres to a site where the coyotes had killed a fawn deer. The neck was hemorrhaged and the lower rib, abdomen, and thigh areas eaten. Ravens had begun to feed on the carcass. There was a small amount of blood on the snow 104 metres before the kill site where the deer and the coyotes had been running.

Scat Analysis

Twenty-nine coyote scats were collected and analysed in 1983. Twenty-three scats contained only the remains of snowshoe hare. Five contained both hare and deer, and one contained only deer remains. The six scats with deer were all found near deer carrion.

Habitat

Table 2 lists the percent of coyote trails through different habitat types. Notable is the high use of wood roads. Feces and urine of coyotes were often associated with roads. An avoidance of hardwoods in preference for softwoods was also noted.

Table 2. *Percent of coyote trails through different habitat types; 79 kilometres total distance.*

Forest Maturity and Non Forest	Cover Type		
	SW	MW	HW
Mature	23.3	14.9	5.7
Pole	13.3	1.9	0.7
Immature	4.5	0.9	0.7
Young	2.7	0.5	0.2
Regeneration	4.2	(all cover types)	
Road	20.2		
Flowage and Water (ice)	3.5		
Bog (treed and untreed)	1.9		
Alders	1.2		

Relationship with Other Predators

At the Chignecto Game Sanctuary bobcats remain plentiful as compared to low numbers provincially. On some days 10 to 20 different bobcat trails were seen. Foxes were uncommon to absent on the Sanctuary, but this is perhaps more the result of habitat than interaction with coyotes.

One coyote-bobcat interaction was observed March 7, 1983. At the base of a mature spruce were many coyote tracks and the lower bark was scraped. A bobcat track over the coyote tracks and leaving the tree indicates that the coyotes had chased the bobcat up the tree. It is unlikely that adult bobcats are in any danger because of coyotes. Bobcat kittens, if caught on the ground, might be killed, but the significance or occurrence of this is unknown.

On March 26, 1985, several bobcat tracks were seen near a coyote-killed deer. Two coyotes passed by the carcass without showing interest and later killed a goshawk.

Inexperienced, young bobcats and coyotes no doubt benefit from partly eaten deer carcasses left by older animals, especially where small game is scarce or hard to catch. Carcasses are quickly cleaned up by ravens so the additional kills as a result of coyotes seem more important than any long term larder of a few kills. In this regard, there does not appear to be any negative relationship between bobcats and coyotes, but rather a reciprocal benefit.

Relationship with Deer

One cannot assume that the behaviour of coyotes observed over 23 days of tracking is completely representative of coyotes in all areas. It is only a sample.

One would expect coyotes to be opportunistic in what they eat. Wild predators also seem to know their limits in catching prey and do not expose their bodies to unnecessary risk. Nature has no forgiveness for injured predators. The observation from this study is that coyotes abandon or catch their prey after a relatively short chase. Unlike dogs, they did not participate in day-long chases of deer. Observations in this study and other examples indicate that coyotes predominantly killed fawn deer.

The 1985 winter tracking located more coyote-killed deer than in the previous two years. Deeper snow in 1985 restricted deer mobility. One would expect weakened deer and deer restricted in movement to be victims of predation.

The 1983 coyote scat analysis and the tracking observations show that small game species, in particular snowshoe hare, are a major part of the coyote's winter diet. Tracking observations indicate that it is remarkably easy for a coyote to catch a hare or other small game.

Kill sites of small game are much less obvious than locations where deer are killed. One must be careful, when making chance observations, not to over-emphasize deer predation.

This study deals only with the relationship of coyote to deer in winter. The effect of coyote predation on deer fawns after birth to a few months old is perhaps significant and deserves separate study.

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